REMARKS

The Amendments

Typographical errors have been corrected in both claims. It appears that words deleted in an earlier response inadvertently were not removed from the claims in the previous response.

Applicants respectfully submit that the amendments add no new matter to the application. Applicants earnestly solicit entry of the amendments.

The Invention

The invention is directed to a device for minimizing cigarette sidestream smoke and reducing the free-burn rate of a burning cigarette. The device comprises a non-combustible tubular element encasing an effective length of a tobacco charge of a cigarette in the tubular element. In one embodiment, the tubular element comprises ceramic material and has a predetermined number of pores and predetermined pore sizes for both minimizing sidestream smoke emission from a burning tobacco charge and restricting inward air flow to reduce free-burn rate of the burning tobacco charge to increase the number of puffs therefrom. In another embodiment, the tubular element consists essentially of a porous ceramic material for both minimizing sidestream smoke emission from a burning tobacco charge and reducing free-burn rate of the burning tobacco charge to increase the number of puffs therefrom.

The Office Action

Both claims stand rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative under 35 U.S.C. § 103(a) as obvious over, Valdez, United States Patent Number 4,685,477. In pertinent part, the Office Action asserts that Valdez discloses a "plurality of air intake spaces, perforations 26, is useful for enabling the ember end of the cigar or cigarette to burn. As the smoker puffs or draws on the primary smoke filter end of the cigar or cigarette, air may be drawn into the second and third chambers through the air intake spaces [perforations 26] to enable the ember to burn. In this manner, sufficient air is provided for burning of the tobacco to generate smoke."

The Office Action further asserts that Valdez discloses that it is possible to control the rate at which the ember end of the cigar or cigarette burns by varying the size and/or number of the air intake spaces [perforations 26]. In this manner, the cigar or cigarette may be made to burn slower and therefore last longer than if smoked without the Valdez device. The Office Action also asserts that Valdez discloses that perforations 26 reduce the free-burning rate of the burning tobacco in order to increase the number of puffs from the burning tobacco charge as claimed by applicant.

Claims 10 and 11 also stand rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative under 35 U.S.C. § 103(a) as unpatentable over, JP06-052497. The Office Action asserts that pores 8 of JP '497 restrict inflow of air to reduce the free burn rate of the tobacco. Alternatively, the Office Action asserts that because the tube of JP '497 encapsulates the tobacco, the tube inherently minimizes sidestream smoke and reduces the free burn rate because less air is supplied to the burning tobacco.

In rebuttal to previous argument relating to Valdez, the Office Action again asserts that there are no structural differences between Valdez and the claims herein. Rather, the Office Action asserts, applicants are ascribing different functions to objects that are structurally identical (anticipation and inherence) or similar (obviousness).

The Office Action also asserts in rebuttal that Valdez meets the structural limitations and dismisses all argument that the structures serve different purposes and so are different structures.

The Cited Documents

Valdez, United States Patent Number 4,685,477, is directed to a device that assists a smoker in holding a cigarette or cigar during smoking. The device, which comprises a tubular member having three chambers, serves as a tubular smoke absorbent filter. A filter material is placed inside the tubular member to define a first chamber; a concentric second tubular member with a perforated wall also may be provided. The second and third chambers are coaxially aligned inside the first chamber and have a wall between them. The cigarette is placed into the second and third chambers. The third chamber is at the 'lighted' end of the cigarette, and has a perforated plate 21 over that end of the tubular member. The third chamber comprises an ash chamber to catch ashes that fall from the ember end of the cigarette or cigar.

The tubular member comprises a plurality of air outlet means 26 to serve as ***exhaust*** pores "through which air filtered of random smoke escapes or is released" (column 5, lines 7-15). A concentric tube can be placed in the tubular member to form an inner sleeve for retaining the filter material. According to Valdez, air enters through air intake spaces 22 in proximal end plate 21.

JP '497 discloses a mouthpiece into which a cigarette or tube of tobacco is inserted. A cylindrical tube is concentric with the longitudinal axis of the cigarette. The tube comprises porous glass, for example, and a fiber filter is inserted in the mouthpiece to be disposed between the mouth of the smoker and the cigarette. The tube may be essentially adjacent to the tobacco charge, or may be spaced away.

The purpose of the device of JP '497 is to absorb and remove only nicotine and tar from sidestream smoke and the smoke the smoker inhales. The glass fiber absorbs the latter, and the glass tube removes the nicotine and tar from the former. The glass tube does not restrict airflow. JP '497 discloses compositions, specific surface areas, pore volume, and pore diameter, as appropriate, that achieve these purposes.

The Invention in view of the Cited Documents

Claims 10 and 11 stand rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over, Valdez. The claims also stand rejected on the same bases over JP '497. The claimed invention also is rejected as inherently disclosed by either patent. Applicants respectfully traverse these rejections. Not only do these documents not disclose, inherently or *in haec verba*, the claimed invention, but also they do not suggest the claimed invention.

Valdez

The Office Action asserts that the plurality of "air intake spaces" 26 in Valdez is useful for enabling the ember end of the cigarette to burn. The Office Action asserts, without citation to the applicable disclosure in Valdez, that Valdez teaches that varying the size and/or number of the "air intake spaces" to control the rate at which the ember end of the cigar or cigarette burns is

possible and concludes that the cigar or cigarette may be made to burn slower and therefore reduce the free-burn rate. Applicants respectfully submit that Valdez describes at Column 5, lines 7-15, that the air outlet means 26 serve as exhaust pores that can be of "any size and number sufficient to allow adequate air flow and output or release of air filtered of random smoke" (emphasis added). It is submitted that one skilled in the art would not interpret this recitation as restricting the inflow of air to thus reduce the free-burn rate of the burning tobacco. In contrast, Valdez is ensuring that the cigarette will stay lit. Valdez does not discuss a reduced free-burn rate at all.

For at least these reasons, Claims 10 and 11 are patentable over Valdez.

The Office Action asserts that Valdez discloses a cigar or cigarette holder that has three chambers. The first chamber is defined by the space between a perforated tubular member, concentrically situated around a perforated inner tubular member, and the inner tubular member, wherein the first chamber is substantially filled with a filter material. The second and third chambers are within the inner tubular member substantially coaxially aligned and separated by a wall having an aperture to transfer ash from the second chamber and the third chamber. The Office Action further asserts that the claimed non-combustible tubular member is deemed as element 25, and that the perforations 26 provide for the claimed porosity recited in the pending claims.

In accordance with that assertion, the plurality of air intake spaces, perforations 26, is said to enable the ember end of the cigar or cigarette to burn. As the smoker puffs or draws on the primary smoke filter end of the cigar or cigarette, air is said be drawn into the second and third chambers through the air intake spaces (perforations 26) to enable the ember to burn; in this manner, sufficient air is provided for burning of the tobacco to generate smoke. The Office

Action further asserts that it is possible to vary the size and/or number of the air intake spaces (perforations 26) to control the rate at which the ember end of the cigar or cigarette burns. In this manner, the cigar or cigarette may be made to burn slower and therefore, last longer than if smoked without the Valdez device. Perforations 26 of Valdez are said to reduce the free-burning rate of the burning tobacco in order to increase the number of puffs from the burning tobacco charge as instantly claimed by applicant.

Applicants respectfully submit that none of these assertions is well-founded. The Office Action has not properly identified the functions of the various elements of Valdez and therefore, Applicants respectfully submit, has come to incorrect conclusions regarding anticipation and obviousness.

Applicants respectfully submit that elements 26 of Valdez are "air outlet means" which serve as the exhaust pores through which air filtered of random smoke (e.g. sidestream smoke) escapes or is released (see Column 5, lines 7-15). Contrary to the assertion in the Office Action, Valdez teaches that element **22** is the plurality of air intake spaces (Column 3, lines 55-57) useful for enabling the ember end of the cigar or cigarette to burn. Applicants respectfully submit that the assertion in the Office Action that element 26 serves this purpose likewise is erroneous. Air may be drawn into the second and third chambers through these air intake spaces, element 22, to enable the ember to burn (see Column 4, lines 8-21). Valdez teaches that it is the air intake spaces, element 22, and not the air outlet means of element 26, that can be varied in size and/or number to control the rate at which the ember end of the cigar or cigarette burns (column 4, lines 15-21). Moreover, it is the air intake spaces, element 22, not the perforations 26, which reduce the free-burning rate of the burning tobacco in order to increase the number of puffs from the burning tobacco charge.

The Office Action also asserts that it is the size and number of perforations, element 26, that minimize the sidestream smoke. Applicant respectfully submits that this assertion is not well-founded. It is the filter material in the first chamber 17 of Valdez that minimizes the sidestream smoke (see Column 4, lines 38-68). The perforations, element 26, of Valdez simply act as exhaust pores (see Column 5, lines 7-15). Valdez recites that the exhaust pores can be of "any size and number sufficient to allow adequate air flow and output or release of air filtered of random smoke". The porosity is not taught or suggested to **both** minimize sidestream smoke and reduce the free-burn rate, as claimed in the present invention. Valdez does not contemplate Applicant's tubular element comprising ceramic material having a predetermined number of pores and predetermined pore sizes to **both** minimize sidestream smoke and reduce the free-burn rate or Applicant's tubular element consisting essentially of porous ceramic material (Claim 11) for **both** minimizing sidestream smoke and reducing the free-burn rate. Rather, Valdez needs two separate elements to achieve this; outlet means 26 and element 22. Element 22 acts as air intake spaces to control the rate at which the ember end of the cigar or cigarette burns.

Accordingly, Valdez teaches that element 22 acts as air intake spaces to control the rate at which the ember end of the cigar or cigarette burns and it is the filter material in the first chamber 17 that minimize the sidestream smoke. In contrast, the claimed invention utilizes the predetermined number of pores and the size of pores (Claim 10) for both minimizing sidestream smoke and reducing the free-burn rate or a tubular element consisting essentially of porous ceramic material (Claim 11) for both minimizing sidestream smoke and reducing the free-burn rate. In contrast, Valdez requires two separate distinct elements to achieve each of these results.

Thus, for at least the reasons set forth above, applicants respectfully traverse this rejection. Perforations 26 do not serve to throttle the amount of air drawn into the core of the tubes. Rather, Applicants respectfully submit that Valdez discloses that elements 26 are "air outlet means" which serve as the ***exhaust*** pores through which air filtered of random smoke (e.g. sidestream smoke) escapes or is released (*see* Column 5, lines 7-15).

It is actually air intake spaces 22 in plate 21 forming the end of the third chamber that Valdez teaches is the air intake element (Column 3, lines 55-57) useful for enabling the ember end of the cigar or cigarette to burn. Air may be drawn into the second and third chambers through the air intake spaces, element 22, to enable the ember to burn (see Column 4, lines 8-21). Valdez teaches that it is the design of end plate 22, not the air outlet means of element 26, which can be manipulated by changing the size and/or number of perforations to control the rate at which the ember end of the cigar or cigarette burns. Moreover, it is the same air intake spaces in end plate 22, not the perforations 26, which reduce the free-burning rate of the burning tobacco in order to increase the number of puffs from the burning tobacco charge.

Further, contrary to the assertions in the Office Action, Valdez discloses that the filter material in the first chamber formed by the concentric tubes minimizes the sidestream smoke (see Column 4, lines 38-68); the perforations 26 simply act as exhaust pores (see Column 5, lines 7-15).

The Office Action asserts that the plurality of "air intake spaces" 26 is useful for enabling the ember end of the cigarette to burn. The Office Action asserts, without citation to any disclosure in Valdez, that Valdez teaches that varying the size and/or number of the "air intake spaces" to control the rate at which the ember end of the cigar or cigarette burns is possible and concludes that the cigar or cigarette may be made to burn slower and therefore reduce the free-

burn rate. Applicants respectfully submit that Valdez describes at Column 5, lines 7-15, that the air outlet means 26 serve as exhaust pores that can be of "any size and number sufficient to allow adequate air flow and output or release of air filtered of random smoke" (emphasis added). It is submitted that one skilled in the art would not interpret this recitation as restricting the inflow of air to thus reduce the free-burn rate of the burning tobacco. In contrast, Valdez is ensuring that the cigarette will stay lit. Valdez does not discuss a reduced free-burn rate at all.

For at least these reasons, Claims 10 and 11 are patentable over Valdez. Further, the claims do not rely upon a different function for patentability. Rather, the pending claims rely on structural differences from the cited document. These differences are described above as they relate to the functionality. In particular, Valdez discloses free air flow, rather than restrictions.

JP '497

Applicants respectfully traverse the rejections over JP '497. JP '497 does not disclose the claimed invention, whether *in haec verba* or inherently, and certainly does not suggest the claimed invention. As described below, Applicants respectfully traverse these rejections.

For example, at paragraphs [0010-11] of JP '497, the encasing section 2 of porous glass is described as having the following properties and characteristics:

Pore size:	0.05 to 15.0 μm
BET Specific Surface Area:	0.1 to 4.0 m^2/g
Pore cubic capacity:	0.4 to 0.6 cm^3/g
Main components:	SiO_2, approximately 70 wt percent
	Al_2O_3, 15 wt percent
	B_2O_3, 7 wt percent

This porous glass is favored from the viewpoint of ventilation.

As described at paragraph [0011] of JP '497, sidestream smoke generated by the cigarette passes through the tobacco encasing section 2 and is emitted into the air and ONLY nicotine and tar contained in the sidestream smoke is captured and removed by the encasing section 2. The sidestream smoke, without nicotine and tar, is emitted into the air (paragraph [0011]). Therefore, the encasing section 2 of JP '497 does not minimize sidestream smoke emission, as is claimed in the present invention. The encasing section 2 simply captures and removes two sidestream smoke components contained in sidestream smoke and emits the remainder of the sidestream smoke components into the air. Embodiments of the tubular element of the claimed invention, on the other hand, has a porous ceramic material that minimizes sidestream smoke or a ceramic material having a predetermined number of pores and pore sizes that minimizes sidestream smoke. The encasing section 2 of JP '497 is able to remove only two components in sidestream smoke and the remainder is emitted into the air, whereas the tubular element of the claimed invention minimizes sidestream smoke (e.g. reduces sidestream smoke to a minimum).

Applicants respectfully submit that the assertion in the Office Action that JP '497 describes that the encasing section 2 comprises fine pores 8 and this allows for restricting the inflow of air to thus reduce the free-burn rate of the burning tobacco is not well-founded. Applicants respectfully submit that the JP '497 reference describes at paragraph [0012] that "oxygen is supplied through venting holes opened all over the surface of the encasing section 2, so the cigarette can stay lit while installed in the encasing section 2". Applicants respectfully submit that one skilled in the art would not interpret this recitation as restricting the inflow of air to thus reduce the free-burn rate of the burning tobacco. In contrast, JP '497 is ensuring that the cigarette will stay lit when the cigarette is not being smoked. JP '497 does not discuss a reduced

free-burn rate at all. As further supported at paragraphs [0010]-[0011], the porous glass (e.g., the encasing section 2), having the following recited characteristics, is favored from the viewpoint of ventilation:

Encasing Section 2 of Cited Reference JP '497

BET Specific Surface Area	0.1 - 4 m^2/g
Avg. Pore Size	0.5 - 15 μm
Specific Pore Volume	0.4 - 0.6 cm^3/g

Moreover, as set forth at paragraphs [0009]-[0010], JP '497 discloses that the other portion of the smoking pipe has a filter 4, which is made of porous glass fiber (this is not the tube but the filter between the smoker and the tobacco charge; this section is for filtering mainstream smoke only) and is provided in the holding section 5. The porous glass fiber of the filter 4 has the recited characteristics:

Filter 4 of Cited Reference JP '497

BET Specific Surface Area	400 m^2/g or more
Avg. Pore Size	50 Å or less
Specific Pore Volume	0.4 - 0.6 cm^3/g

This composition is favored due to its superior heat resistance and absorption performance.

Comparison of the encasing section 2 of the cited reference with the filter 4 of the cited reference clearly illustrates a large difference between the ventilation characteristics of the filter 4 and of the encasing section 2 of the cited reference. JP '497 clearly is choosing different characteristics for the materials of the filter 4 as compared to the encasing section 2. The

characteristics of the filter 4 were chosen by the inventor to ensure sufficient filtration, therefore low ventilation, in order to treat mainstream smoke; whereas, the characteristics of the encasing section 2 were chosen by the inventor of '497 to ensure lower filtration (as attested by the emission of sidestream smoke therethrough) and high ventilation to ensure that the encasing section 2 does not interfere with the burning of the cigarette. The inventor of '497 is ensuring that the pores are large enough (0.05-0.15 μm) in the encasing section 2 and are provided all over the surface of the encasing section 2 to achieve a favored ventilation to ensure that the cigarette is burning so that the presence of the encasing section 2 does not have an effect on the burning of the cigarette itself. Applicants respectively reiterate that JP '497 does not discuss a reduced free-burn rate at all, as is claimed in the present invention.

As discussed above, the encasing section 2 of the cited reference and the tubular element of the claimed invention are very different. The porosity of the tubular element of the claimed invention minimizes sidestream smoke emission from a burning tobacco charge and reduces free-burn rate of such burning tobacco. Firstly, the encasing section 2 of the cited reference only removes two components of the sidestream smoke but it does not minimize sidestream smoke, as claimed in the present invention. In fact, JP '497 clearly states that the encasing section 2 of the cited reference simply removes nicotine and tar and the remainder of the sidestream smoke is emitted through the tube. Therefore, it does not minimize sidestream smoke. Secondly, the reference describes at paragraph [0012] that "oxygen is supplied through venting holes opened all over the surface of the encasing section 2, so the cigarette can stay lit while installed in the encasing section 2". The structure of JP '497 ensures that the cigarette will stay lit when the cigarette is not being smoked. The structure of JP '497 ensures that the pores are large enough (0.05-0.15 μm) and are provided all over the surface of the encasing section 2 to ensure that the

cigarette is burning. Thus, the presence of the encasing section does not have an effect on the burning of the cigarette. Importantly, JP '497 does not discuss a reduced free-burn rate at all. Therefore, the properties and characteristics, and particularly the structures, of the encasing section 2 of the cited reference and the tubular element of the claimed invention are quite different.

Moreover, properties and characteristics of some examples of the tubular element of the claimed invention are shown below in comparison with the encasing section 2 of the cited reference and in comparison to the filter 4 of the cited reference (Remember: filter 4 is solely used to reduce mainstream smoke only):

	Tubular Element	**Encasing Section 2 of Cited Reference**
BET Specific Surface Area	5 - 230 m^2/g	0.1 - 4 m^2/g
Avg. Pore Size	0.0013 – 0.012 μm	0.5 - 15 μm
	(13-120 Å)	(5,000-150,000 Å)
Specific Pore Volume	0.09 - 0.16 cm^3/g	0.4 - 0.6 cm^3/g

	Tubular Element	**Filter 4 of Cited Reference**
BET Specific Surface Area	5 - 230 m^2/g	400 m^2/g
Avg. Pore Size	13-120 Å	50 Å or smaller
Specific Pore Volume	0.09 - 0.16 cm^3/g	0.4 - 0.6 cm^3/g

As is shown, the porosity properties and characteristics of the tubular element of the claimed invention are similar to the filter 4 of the cited reference, where JP '497 uses such

properties and characteristics to filter mainstream smoke only. Consequently, the porosity characteristics of the tubular element, and hence the structure, of the claimed invention are much different from the properties and characteristics, and hence the structure, of the encasing section 2 of JP '497. Thus, the tubular element of the claimed invention provides much better filtration, as discussed above, than does the encasing section 2 of the cited reference. The porosity of the claimed tubular element is much lower, and thus has better filtration, than that of the encasing section 2 of the cited reference. The pores of the glass tube of the cited reference are far too large to provide any retention of combustion gases around the burning ember to reduce the rate of combustion and minimize release of sidestream smoke particles through the encasing section 2, as compared to the tubular element of the claimed invention. Moreover, the pores of the glass tube of the cited reference are far too large to provide any restriction of inward flow of air to reduce the free-burn rate of the cigarette. As reflected in their different functions, the structures are different.

The porosity of the encasing section 2 of the cited reference was chosen to remove nicotine and tar from sidestream smoke but it was also chosen to ensure that the cigarette within the tube remained lit and for the remainder of the sidestream smoke to pass through the tube. Based on the teachings of the cited reference, one skilled in the art would not attempt to achieve the porosity of the claimed invention since the cited reference clearly teaches that it is concerned about the cigarette remaining lit. Moreover, the inventor of the cited reference was completely aware of the lower porosity with respect to the filter 4 and chose not to use such a porosity with encasing section 2. Therefore, the skilled practitioner would not consider lowering the porosity of the tube of JP '497 as JP '497 teaches not to affect the burning of the cigarette, as JP '497 wants to achieve normal ventilation. Thus, JP '497 teaches away from the claimed invention.

As discussed above, the porosity characteristics of the tubular element of the claimed invention are similar to the filter 4 of the cited reference, where the inventor uses such characteristics to filter mainstream smoke only. Consequently, the porosity properties and characteristics of the tubular element of the claimed invention are much different than those of the encasing section 2 of the cited reference and thus, the tubular element of the claimed invention provides much better filtration, as discussed above, than the encasing section 2 of the cited reference. The porosity of the tubular element is much lower, and thus has better filtration, than that of the encasing section 2 of the cited reference. The pores of the glass tube of the cited reference are far too large to reduce the rate of combustion and minimize release of sidestream smoke particles through the encasing section 2, as compared to the tubular element of the claimed invention. Moreover, the pores of the glass tube of the cited reference are far too large to provide any restriction of inward flow of air to reduce the free-burn rate of the cigarette. The differences between embodiments of the structures as claimed and those of the cited documents are reflected in the different functions these structures are expected to perform.

The Office Action asserts that apparatus claims must be distinguished in structure and invokes inherency. However, as set forth above, the structures are different – they must be different precisely because the functions are different. Applicants respectfully submit that the inherency rejections are not well-founded for at least the reasons set forth above. The Office Action identifies 'porosity' and asserts that such porosity must therefore inherently have the same structure that the claimed invention has. However, this position fails to appreciate that 'porosity' that, for example, traps only nicotine and tar, but nothing else, or which allows for free flow of oxygen to maintain burning of the tobacco, is not sufficient to meet the claims herein. This porosity has different properties and characteristics, and hence structure, from the porosity

having the properties and characteristics claimed herein. As set forth above, the properties and characteristics of the claimed structure are different from those of the cited documents, as the documents themselves illustrate. Thus, the invention is not inherently disclosed in either of the cited documents.

CONCLUSION

Applicants respectfully submit that the Office Action is based on assertions that are not well-founded and are indeed contrary to the teachings of the cited art, Valdez and JP '497. The structures of the claimed invention are different from those of Valdez and JP '497. For at least the reasons set forth herein, Applicants respectfully traverse the rejections of claims 10 and 11.

Respectfully submitted,

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